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On a small collection of non-marine ostracods from Mongolia, with the description of a new species (Crustacea, Ostracoda)*

by
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Abstract: A small collection of freshwater ostracods from Mongolia is identified. In all, seven species are found. *Ilyocypris mongolica* n. sp. is here described as new; its main characteristic features are the long natatory setae on the A2; the divided penultimate segment on the T1, the two lateral setae and the apical hook-like structures on the penultimate segment of the T2 and the shape of the ls, the ms and the stylus of the hemipenis. Two of these features are here used for the first time in this genus and their validity in broader future revisions in this group is discussed. While evaluating the position of the new species in the genus, *Ilyocypris hartmanni* from Lake Tiberias is reinstated as a valid species, quite distinct from *I. monstrifica*, while *I. turca* is considered a junior synonym of *I. brehmi*, both described from Turkey.
The main zoogeographical component of this limited collection from Mongolia is Palaearctic.
Key words: *Ilyocypris mongolica* sp. n., Crustacea, Ostracoda, Mongolia

INTRODUCTION

The recent non-marine ostracod fauna of Mongolia and surrounding territories remains ill known. Most faunistic and taxonomic reports date from the first decade of this century: SARS (1903a,b) on China and Sumatra, DADAY (1901, 1903, 1904, 1909) on Mongolia, Turkestan and the western part of China. Since then, no significant contributions have been published. In all, several dozens of species have been reported from this region. Most of these taxa, however, were never found again and their types are either lost or were never re-examined (exception: *Ilyocypris dentifera* and *I. angulata* - see below). As a consequence, the taxonomic position of these species remains highly obscure. As usual, related entomostracous groups such as Branchiopoda and Copepoda are somewhat better off, and a number of more recent reports update the faunistic lists for these regions (BRTEK *et al.* 1984, FLÖSSNER 1986).

WILLIAMS (1991) gives a thorough and educative review of the saline inland waters of Mongolia and China. Information on the ostracods from these regions cited by him is scarce, and constitutes mostly unpublished and isolated identifications. His main zoogeographical conclusions are discussed below. Finally, a number of larger Mongolian lakes belongs at least partly to the Baikalian Realm or Subrealm (according to source) in the Palearctic; an account of these fauna's is presently been evaluated by MAZEPOVA (in prep.).

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The present note reports on a small collection of ostracods from slightly saline waterbodies, collected by Dr. Z. KASZAB in 1965 and 1968. In all, seven species are found, one of which is here described as new.

MATERIAL AND METHODS

Abbreviations used in text and figures: ***a-e*** = parts of labyrinth in hemipenis, ***A1*** = Antennula, ***A2*** = Antenna, ***Cp*** = carapace, ***H*** = height of valves, ***L*** = length of valves, ***ls*** = lateral shield of hemipenis, ***LV*** = left valve, ***Md*** = Mandibula, ***ms*** = medial shield of hemipenis, ***Mx1*** = Maxillula, ***Mx2*** = Maxilla, ***RV*** = right valve, ***st*** = stylus of hemipenis, ***T1*** = first thoracopod, ***T2*** = second thoracopod.

List of localities

307: saline pool, central aimak, at camp near river Kerulen, 45 km E of Somon Bajandelger, alt. 1340 m. Collected with a handnet on 27.VII.1965. (contained only unidentifiable larvae)

479: saline ditch in flood area of the river, central aimak, at camp near river Kerulen, 45 km E of Somon Bajandelger, alt. 1340 m. Collected with handnet on 25.VIII.1965.

1017: pools and waterholes, Uvs Aimak, near Lake Bag nuur, 6 km NE of Somon Zuungobi, alt. 1000 m. Collected with handnet on 25.VI.1968.

1120: near edge of river, Chövsgöl aimak, 8 km NE of Somon Alag-erdene, near river Egijn gol, alt. 1600 m. Collected on 17.VII.1968. (contained only unidentifiable larvae)

For more information on these localities, see KASZAB (1965, 1968).

LIST OF SPECIES

Ilyocypris mongolica sp. n.	479
Notodromas monacha (O.F. Müller, 1776)	1017
Pseudocandona rostrata (Brady & Norman, 1889)	1017
Cypris pubera O.F. Müller, 1776	479
Heterocypris salina (Brady, 1868)	1017
Dolerocypris fasciata (O.F. Müller, 1776)	1017
Cypridopsis dubia Sars, 1903	1017

TAXONOMIC DESCRIPTIONS

Class	Ostracoda Latreille, 1806
Subclass	Podocopa G.W. Müller, 1894
Order	Podocopida Sars, 1866
Suborder	Podocopina Sars, 1866
Infraorder	Cypridocopina Jones, 1901
Superfamily	Cypridoidea Baird, 1845
Family	Ilyocyprididae Kaufmann, 1900
Genus	Ilyocypris Brady & Norman, 1889

Ilyocypris mongolica sp. n.

(Fig. 1)

Type locality: saline ditch in flood area of the river Kerulen, near camp, central aimak, 45 km east of Somon Bajandelger, Mongolia, alt. 1340 m.

Type material:

Holotype: a male, with soft parts dissected in glycerine in a sealed slide, and with valves stored dry (nos KM.1422 a, b; IV/P-399, 400).

Allotype: a female, dissected and stored as the holotype (only *RV* kept, *LV* broken and lost - nos KM.1424 a, b; IV/P-401, 402).

Paratypes: two females, with valves crushed and to some extent decalcified, stored in spirit (no. IV-557)

Diagnosis: a medium-sized Ilyocypris, with surface sculptures limited, apart from a row of wart-like tubercules along the posterior margin; natatory setae on *A2* reaching beyond tips of claws with about half their length; *T1* with penultimate segment divided; *T2* with two long lateral setae on penultimate segment, this segment apically further with 4-6 hook-like structures; hemipenis with widely dilating, triangular lateral shield (*ls*), a medial shield (*ms*) consisting of two elongated lobes and a narrow, nearly straight stylus.

Additional description of the male

Valves (Figs 1B,C) high and with a straight dorsal margin; anterior margin widely rounded, posterior margin nearly straight, both set with a row of tubercules. Anterior calcified inner lamella narrow, posterior calcified inner lamella minute and not running to the highest point of the posterior margin. In dorsal view, both extremities bluntly pointed, greatest width situated approximately in the middle, no lateral tubercules present on the available specimens; anterior sulcus present in the first third of the valves. Length of holotype = 850 μm.

A1 with five endopodal segments of nearly equal length; natatory setae very long.

A2 with natatory setae reaching beyond tips of endclaws with slightly more than half of their length; aesthetasc Y short and stout, not reaching beyond the distal edge of the first endopodal segment. Apical chaetotaxy: penultimate segment with 1 long and 3 minute 't'-setae, apically with 2 long and normal 'z'-setae, third 'z'-seta claw-like. Other aspects of chaetotaxy typical of the Cypridoidea: penultimate segment with a minute aesthetasc y2 and 3 large claws; terminal segment with claws Gm and GM, the bifurcated aesthetasc y3 (short and stout); seta 'g' not seen.

Md with coxa stout and wide; palp large.

Mx1 with second palpsegment twice as wide as long; chaetotaxy of entire limb without special features.

Prehensile palps (Figs. 1F,G) subequal, with elongated and narrow first segment, subapically carrying 2 long sensory organs; terminal segment distally swollen and with 1 apical and 1 subapical sensory organ, both long.

T1 (Fig. 1H) with all setae short, seta d2 missing; penultimate segment clearly divided; claw slender.

T2 (Fig. 1I) with penultimate segment carrying 2 long lateral setae; apically with 3 stout and 1 slender hook-like structures (transformed setulae) (Fig. 1K).

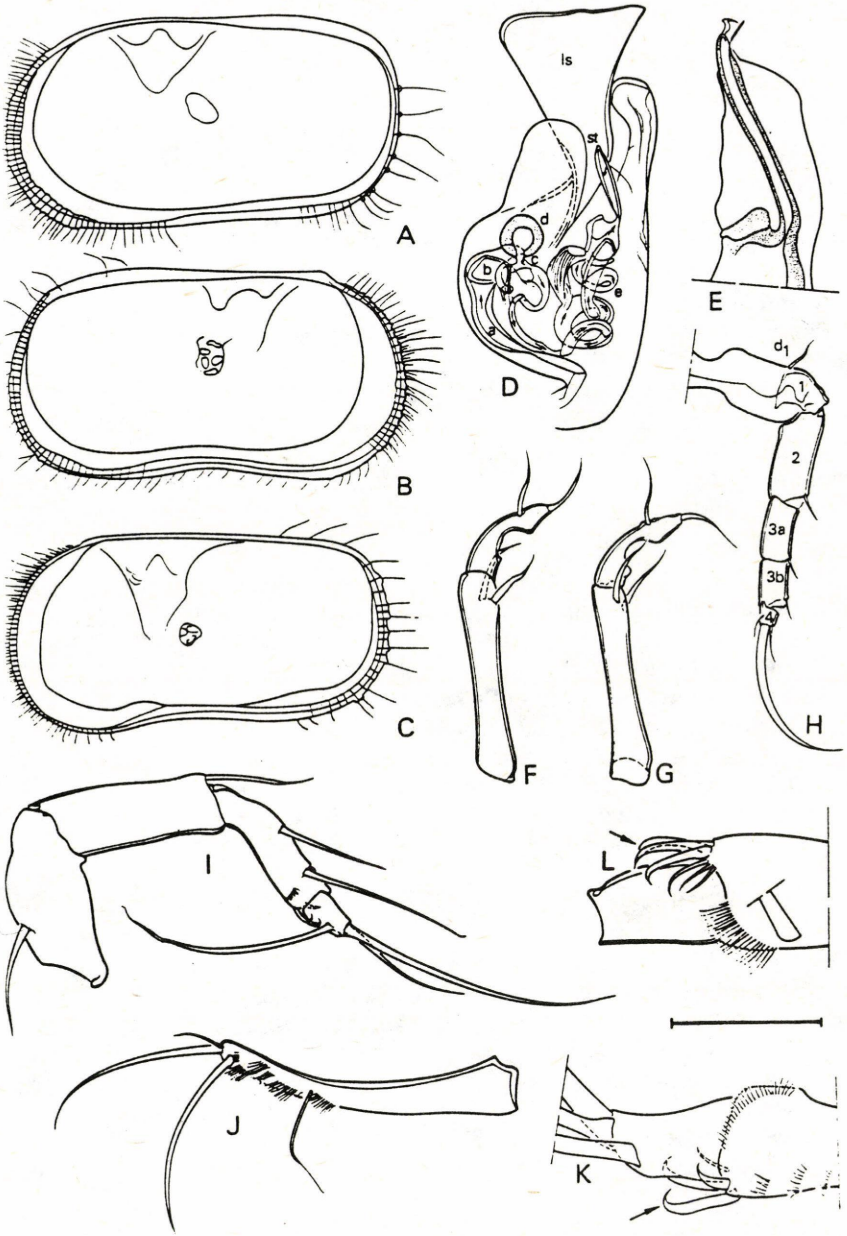

Fig. 1. *Ilyocypris mongolica* sp. n. (A,L= female allotype no. KM.1424 a, b; IV/P-399, 400; B-K= male holotype no. KM.1422 a, b; IV/P-401, 402)
A= female, RV, internal view, B= male, LV, internal view, C= male, RV, internal view, D= male, hemipenis, E= Idem, detail of stylus, F= male, left prehensile palp, G= male, right prehensile palp, H= male, T1, I= male, T2, J= male, furca, K= male, T2, detail of apical hooks on third segment, L= female, idem.
Scale= 298 nm for A-C, 146 nm for H, 78 nm for D, F, G, I, J, 29 nm for E, K, L.

Furca (Fig. 1J) with claws subequal and slender, proximal seta inserted at about 2/5 of the total length of the ramus and relatively long. Furcal attachment short, stout and unbranched. Zenker's organ with the globular extremities typical of the genus and with ca. 14 spinous whorls.

Hemipenis (Fig. 1D,E) with a complex labyrinth, a sclerified and globular part 'd' and with inner spermiduct after the labyrinth showing at least 3 loops. Actual copulatory process a long stylus, straight and with sclerified walls, only slightly sinuous. Lateral shield (*ls*) strongly dilating, forming a nearly perfectly symmetrical triangle. Medial shield (*ms*) consisting of two lobes; ventral lobe subrectangular and relatively wide; dorsal lobe long and narrow, reaching about halfway the *ls*.

Additional description of the female

Valves (Fig. 1A) somewhat higher and more solidly built than in the male, but not longer. Surface ornamentation as in the male.

A2 as in the male (see remark).

A1, *Md*, *Mx1*, *T1* and furca either without special features or as in the male.

Mx2 with palp 3-segmented, but with distal segment minute.

T2 (Fig. 1L) with penultimate segment apically with 4-6 hook-like structures.

Remark: the absence of a sexual dimorphism in the apical chaetotaxy of the *A2* is a most interesting feature. The extent and nature of exactly this dimorphism has indeed been cited as a possible tool to create or at least falsify the higher taxonomy of the Cypridoidea (MARTENS 1987). It further illustrates that the Ilyocyprididae stand well apart from the Candoninae (which show an advanced sexual dimorphism in the apical chaetotaxy of the *A2* - see DANIELOPOL 1978 and numerous other papers, BROODBAKKER & DANIELOPOL 1982), with which this group does share a number of morphological similarities.

DIFFERENTIAL DIAGNOSIS

1. Based on classical features

SARS (1903b) described *Ilyocypris dentifera* and *I. angulata* from Central Asia. Both species differed mainly by the presence of lateral tubercules in the latter taxon, completely absent in *I. dentifera*. VICTOR & FERNANDO (1981) reexamined the types of both species and concluded that both nominal taxa were only the extremes of a series of intermediate morphologies of one and the same species. They suggested to consider *I. angulata* a junior synonym of *I. dentifera*. I here accept these views. Completely unaware of this paper, CHEN SHOU-ZHONG (1990) described the male of what he still called *I. angulata*.

I. mongolica sp. n. differs from *I. dentifera* Sars by the undivided penultimate segment of the *T1* in the latter species and by the shape of the **ms** of the hemipenis, which is a blunt, undivided lobe in *I. dentifera*.

Other species of this genus cited from Central Asia are *Ilyocypris bradyi* Sars (as *Ilyocyprella repens* (Vavra) in DADAY 1904), which differs from the new species mainly in the length of the natatory setae on the *A2* and *Ilyocypris lacustris* Kaufmann (in SARS 1903a), which has three lateral setae on the penultimate segment of the *T2* (see below). At least the latter identification appears doubtful to me, and these specimens could belong to *I. mongolica* sp. n.

I. brehmi Schäfer from Turkey somewhat resembles *I. mongolica* sp. n. in the shape of the valves. But also this species has an undivided penultimate segment on the *T1*. It should furthermore be noted that *Ilyocypris turca*, described by GHETTI (1972) from a ricefield in Turkey, is without any doubt a junior synonym of *I. brehmi*.

Ilyocypris nagamalaiensis Victor & Michael from India is much smaller and has a very aberrant valve outline, even to the extent that its generic assignement should be re-investigated. Nothing is known with regard to the soft part anatomy of *Ilyocypris taprobanensis* Neale from Sri Lanka. Its valve anatomy is relatively non-descriptive, but the species is again significantly smaller than *I. mongolica* sp. n.

The shape of the valves furthermore separates the new species from *I. nitida* Lerner-Seggev (from Lake Tiberias - very elongated) and from *I. hartmanni* Lerner-Seggev (idem) and *I. monstrifica* (Norman, 1862) (both species always set with large lateral tubercules). It should be noted that HENDERSON (1990) implicitely synonimized *I. hartmanni* with *I. monstrifica*. However, comparison of topotype material from Lake Tiberias of the former taxon with Western European (Belgian) specimens of the latter species clearly shows that these are two good and very distinct species.

In the shape of the hemipenis (*ls* and *ms*), *I. mongolica* sp. n. furthermore differs at least from *I. hartmanni* and *I. divisa* Klie; the latter species furthermore has a nearly squarish posterior extremity in dorsal view, which is bluntly pointed in *I. mongolica* sp. n.

The following species have an undivided third (penultimate) segment on the *T1*: *I. gibba* (Ramdohr), *I. biplicata* (Koch), *I. australiensis* Sars s.l., *I. iners* Kaufmann and *I. lacustris* Kaufmann. The *T2* has three setae (instead of two) on the penultimate segment in *I. lacustris* and *I. getica* Masi. *I. bradyi* Sars and *I. inermis* Kaufmann s.l. have reduced natatory setae on the *A2*.

2. *New characters*

The taxonomy of the genus *Ilyocypris* is confused and the identification of its species never easy, not even when males are available. The few characteristics commonly used to distinguish between the various species are (see above): surface sculpture (very variable), length of natatory setae on *A2* (generally suspect), penultimate segment on *T1* divided or not and number of lateral setae on the penultimate segment of the *T2*. In order to improve on this situation, new characters need to be introduced. I will here briefly discuss the value of two of such new morphological features.

Copulatory process

The actual copulatory process in the hemipenis of *I. mongolica* sp. n. has the shape of a long, narrow, bluntly pointed and slightly sinuous sclerified stylus. As this process takes part in the actual copulation, but also in the pre-copulatory behaviour, i.e. stimulating the female into accepting the male, its morphology is in all probability species-specific. A brief survey of material of species available to me showed that this structure indeed has a different morphology in different taxa. It still has a stylus-shape in *I. getica*, but much shorter and wider. It is significantly curved in *Ilyocypris* spec. sp. n. (described from the Sudan by MARTENS, 1984) and is a rounded structure in the North African populations of what is still called *I. australiensis*. Especially this structure shows great promise as a useful tool for the revision of bisexual *Ilyocypris*-populations.

Hook-like structures on T2

It appears that a certain group of species in this genus has such structures, again in varying shape and number, which makes it a handy identification character in cases where males remain absent. As was described above, *I. mongolica* sp. n. has between 4 and 6 hooks, apically inserted on the penultimate segment of the *T2*. Strongly sclerified, but straight blade-like structures could be detected in *I. getica*. Other species checked lacked these structures and only had the normal row of fine setulae there.

Both sets of characters merit further elaboration and should be described, even for so-called well-known species, whenever material becomes available.

DISCUSSION

Five of the seven species here recorded have a wide Palaearctic or a Holarctic distribution or are cosmopolitan. Similar conclusions were reached for related crustacean groups by BRTEK *et al.* (1984) (on Branchiopoda) and FLÖSSNER (1986) (Branchiopoda and Copepoda). The ostracod species recorded by DADAY (1901, 1903, 1904, 1909) and SARS (1903a,b) were mostly inadequately described as new; their status needs urgent clarification. *Cypridopsis dubia* is an Asian species, unknown in Europe, and probably represents a new genus, which occurs both in Africa and in Asia (MARTENS & MEISCH, in preparation). *Ilyocypris mongolica* sp. n. is thus far known from its type locality only. A higher degree of endemism in this genus is not unusual.

Although both localities with ostracods are noted as being 'saline', most species reported here are purely freshwater taxa. Only *Heterocypris salina* is known to occur in waters with salinities around 3 g/l or more. There is no information on the exact water chemistry of both localities. WILLIAMS (1991) recently gave a review on the saline lakes of Mongolia and China. He concluded that most lakes of low or moderate salinity comprise widespread halotolerant freshwater forms, which seems to coincide with the present data on the ostracods. It should finally be noted that *I. mongolica* sp. n. is probably not a 'regionally endemic halophile', as it occurs together with the freshwater species *Cypris pubera*.

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REFERENCES

BROODBAKKER, N. & D.L. DANIELOPOL, (1982): The chaetotaxy of Cypridacea (Crustacea, Ostracoda) limbs: proposals for a descriptive model. - *Bijdragen tot de Dierkunde*, **52**: 103-120.

BRTEK, J., L. FORRÓ & J.E. PONYI (1984): Contributions to the knowledge of the Branchiopoda (Crustacea) fauna of Mongolia. - *Annls hist.-nat. Mus. natn. hung.*, **76**: 91-99.

CHEN SHOU-ZHONG, (1990): Description of a male *Ilyocypris angulata* Sars (Crustacea, Ostracoda). - *Acta micropalaeontologica Sinica*, **7**: 257-264.

DADAY, E. (1901): Mikroskopische Süsswasserthiere (Édesvízi mikroszkópi állatok). - *Zoologische Ergebnisse der dritten asiatischen Forschungsreise des Grafen Eugen Zichy, redigiert von Dr. G. Horváth*, Budapest-Leipzig, **2**: 375-470.

DADAY, E. (1903): Mikroskopische Süsswassertiere aus Kleinasien. - *Sber. k. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. I*, **112**: 139-167.

DADAY, E. (1904): Mikroskopische Süsswassertiere aus Turkestan. - *Zool. Jb. Syst.*, **19**: 469-553.

DADAY, E. (1909): Beiträge zur Kenntnis der Fauna Turkestans auf Grund des von D.D. Pedaschenko gesammelten Materials. V. Ostracoden und Plankton der Seen Issyk-Kul und Tschatyr-Kul. - *Travaux de la Société Imperiale des Naturalistes de St.-Petersbourg, Sect. Zool.*, **39(2)**: 1-58.

DANIELOPOL, D.L. (1978): Über Herkunft und Morphologie der Süsswasserhypogäische Candoninae (Crustacea, Ostracoda). - *Sber. Österr. Akad. Wiss., Mathem.-naturw. Kl., Abt. I.*, 187: 1-162.

FLÖSSNER, D. (1986): Contribution to the knowledge of the Branchiopod and Copepod Fauna of Mongolia. - *Mitt. Zool. Mus. Berlin*, **62**: 3-40.

GHETTI, P.F. (1972): L'ostracodofauna di alcune risaie turche e persiane. - *Ateneo Parmense, Sez. 2: Acta naturalia, N.S.* **8(suppl. 1)**: 117-147.

HENDERSON, P.A. (1990): Freshwater ostracods. *Synopsis of the British Fauna (N.S.)*, **42**: 1-228.

KASZAB, Z. (1965): Ergebnisse der zoologischen Forschungen von Dr Z. Kaszab in der Mongolei. 66. Liste der Fundorte der III. Expedition. - *Folia ent. hung.*, **18**: 587-623.

KASZAB, Z. (1968): Ergebnisse der zoologischen Forschungen von Dr Z. Kaszab in der Mongolei. 186. Liste der Fundorten der VI. Expedition. - *Folia ent. hung.*, **21 (Suppl.)**: 389-444.

MARTENS, K. (1984): On the freshwater ostracods (Crustacea, Ostracoda) of the Sudan, with special reference to the Red Sea Hills, including a description of a new species. - *Hydrobiologia*, **110**: 137-161.

MARTENS, K. (1987): Homology and functional morphology of the sexual dimorphism in the antenna of Sclerocypris Sars, 1924 (Crustacea, Ostracoda, Megalocypridinae). - *Bijdragen tot de Dierkunde*, **57**: 183-190.

SARS, G.O. (1903a): On the Crustacean Fauna of Central Asia. Part 3. Copepoda and Ostracoda. - *Annuaire du Musée zoologique de l'Academie impériale des sciences de St.-Petersbourg*, **8**: 195-264.

SARS, G.O. (1903b): Freshwater Entomostraca from China and Sumatra. - *Archiv for Mathematik og Naturvidenskab*, **15(8)**: 1-44.

VICTOR, R. & C.H. FERNANDO (1981): *Ilyocypris dentifera* Sars, 1903 versus *Ilyocypris angulata* Sars, 1903. A taxonomic study of two species of Ilyocypris Brady and Norman, 1889 (Crustacea, Ostracoda) described from China. - *Can. J. Zool.*, **59**: 1103-1110.

WILLIAMS, W.D. (1991): Chinese and Mongolian saline lakes: a limnological overview. - *Hydrobiologia*, **210**: 39-66.

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